

WHAT IS CLAIMED IS:

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1. A stent delivery catheter assembly, comprising:

a) a catheter including an elongated catheter shaft having a proximal end and a distal end with an inner inflation lumen extending therein;
an expandable member having a proximal end and a distal end, a

length and a desired inflated diameter disposed near the distal end of the elongated catheter shaft which is in fluid communication with the inner inflation lumen, the expandable member being adapted to receive a stent for mounting thereon; and

b) a moveable sheath adapted to cover a portion of the stent during delivery and having an inner lumen with smaller diameter than the desired inflated diameter of the expandable member, the sheath being movable over a portion of the expandable member so that only a portion of the expandable member not covered by the sheath expands to a desired inflated diameter upon inflation; and

c) a stent mounted on the expandable member.

2. The stent delivery catheter assembly of claim 1, wherein:

the stent has a length which is smaller than the length of the expandable member.

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3. The stent delivery catheter assembly of claim 1, wherein:
the moveable sheath covers the entire stent during delivery.

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4. The stent delivery catheter assembly of claim 1, wherein:
the moveable sheath has a distal tip which is substantially
expandable and expands as the expandable member is expanded.

5. The stent delivery catheter assembly of claim 1, wherein:
the moveable sheath includes an inner surface having a lubricious
coating decrease friction between the sheath and stent.

6. The stent delivery catheter assembly of claim 1, wherein the
sheath has a proximal and a distal portion and the inner lumen which extends within
the distal portion of the sheath is provided with larger internal transverse dimensions
than the inner lumen of the proximal portion thereof to facilitate receiving the stent
and the expandable member.

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7. A method of delivering a stent within an area of treatment in a

body lumen, comprising:

mounting a stent upon an expandable member having a length greater than the length of the stent;

5 covering the stent and expandable member with a moveable sheath which is disposed in a co-axial arrangement over the stent and expandable member;

advancing the stent and expandable member into the area of treatment in the body vessel;

10 retracting the sheath to expose the mounted stent on the expandable member;

inflating the expandable member to expand the stent within the body vessel; and

deflating the expandable member.

8. The method of claim 7, wherein:

the moveable sheath can be placed along the expandable member to create a working length of the expandable member in which only the portion of the expandable member is not covered by the sheath will expand when inflated; and

5 after the expandable member has been deflated, the sheath is moved over the expandable member to create a working length of the expandable member which is utilized to expand any portion of the stent which has not been fully

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deployed within the area of treatment.

9. The method of claim 8, further comprising:

adjusting the position of the expandable member within the area of treatment to perform subsequent expansion of the initially expanded stent.

10. The method of claim 7, wherein:

when the sheath is retracted to expand from the stent, an effective working length is created on the expandable member which corresponds to the length of the stent.

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